

CLAIM LISTING

1.(CANCELED) An apparatus for controlling the rotation of a gear around a hub, said apparatus being comprised of a cam and an arm in combination with a rod adapted to contact the teeth of said gear,

said cam is a plate attached to an axle which is perpendicularly fixed to a planar base, wherein said plate is adapted to rotate around said axle in a plane parallel to said base,

said plate includes a first slot, a first groove and shoulder means for movably engaging said rod which is slidably attached to said base,

said first slot extends radially from the edge of said plate toward said axle, said first groove is formed in at least a peripheral portion of said plate between the top surface and the bottom surface of said plate and extends from said edge toward said axle, said first groove intersects said first slot;

said arm comprises a housing having two open ends and a hollow interior and a cylinder, said housing is fixed to said planar base and positioned thereon to avoid contact with said plate and to permit said cylinder to slidably move in said first groove,

said housing contains at least one coil in said hollow interior wherein said coil is adapted to conduct an electric current,

said cylinder includes a solid portion and hollow portion having a closed end, said solid portion is adapted to longitudinally slide within said coils in said hollow interior of said housing,

said hollow portion of said cylinder contains a second slot, a first biasing spring, a second biasing spring and a pin, said second slot is formed in opposite walls of said hollow portion and is parallel to the longitudinal axis of said cylinder, said second slot intersects said first slot when said cylinder is slidably positioned in said first groove, said pin is positioned

perpendicularly to said longitudinal axis of said cylinder between said first biasing spring and said second biasing spring and extends from said second slot into said first slot.

2.(NEW) An apparatus comprised of at least a first gear, a swing arm, a rod, a cam and an actuation arm wherein:

said first gear is rotatably attached to a first hub which is perpendicularly affixed to a planar base, said first gear is equipped with a first set of teeth and is adapted to rotate around said first hub in a plane parallel to said planar base;

said swing arm is rotatably attached to said planar base and is equipped with a second set of teeth adapted for intermeshing contact with said first set of teeth upon rotation of said first gear around said first hub;

said rod is slidably mounted on said planar base and is adapted to control the rotation of said first gear around said first hub;

said cam is rotatably attached to a cam axle which is perpendicularly affixed to said planar base, and is equipped with means to linearly move said rod upon rotation of said cam around said cam axle; and

said actuation arm is affixed to said planar base and is equipped with means to rotate said cam around said cam axle;

further wherein

said cam is a substantially circular plate having a first slot, a first groove, shoulder means for linearly moving said rod, a top surface and a bottom surface;

said first slot penetrates said cam from said top surface to said bottom surface and extends radially from the edge of said cam toward said cam axle;

78 said first groove is formed in at least a peripheral portion of said cam between said top
79 surface and said bottom surface, extends from the edge of said cam toward said cam axle, and
80 intersects said first slot;

81 said actuation arm is comprised of a housing and a cylinder;

82 said housing is fixed to said planar base and is positioned thereon to avoid contact with
83 said cam, said housing has two open ends and a hollow interior wherein at least one coil,
84 adapted to conduct an electric current, is positioned in said hollow interior;

85 said cylinder includes a solid portion and hollow portion having a closed end, wherein
86 said solid portion is adapted to longitudinally slide within said at least one coil in said hollow
87 interior of said housing, and said hollow portion is slidably positioned within said first groove of
88 said cam;

89 said hollow portion of said cylinder contains a second slot, a first biasing spring, a
90 second biasing spring and a pin positioned between said first biasing spring and said second
91 biasing spring;

92 said second slot is formed in opposite walls of said hollow portion of said cylinder, is
93 parallel to the longitudinal axis of said cylinder, and intersects said first slot when said cylinder
94 is positioned in said in said first groove;

95 said pin is positioned in said hollow portion of said cylinder perpendicular to said
96 longitudinal axis of said cylinder and extends from said second slot into said first slot, whereby
97 linear movement of said cylinder is converted by said pin to rotational movement of said cam to
98 thereby linearly move of said rod to control rotation of said at least first gear.

99 3.(NEW) The apparatus of claim 2 further comprised of battery means for supplying said
100 electric current to said at least one coil to thereby cause linear movement of said cylinder.

101 4.(NEW) The apparatus of claim 3 further comprised of remote means to cause said battery to
102 supply said electric current to said at least one coil.

103 5.(NEW) The apparatus of claim 2 is a handcuff.

104 6.(NEW) The handcuff of claim 5 wherein said pin extends to said top surface and to said
105 bottom surface of said improved cam.

106 7.(NEW) The handcuff of claim 6 further comprised of a second gear rotatably attached to a
107 second hub which is perpendicularly affixed to said planar base, said second gear is equipped
108 with a third set of teeth and is adapted to rotate around said second hub in a plane parallel to
109 said planar base;

110 said third set of teeth is adapted for intermeshing contact with said second set of teeth
111 on said swing arm upon rotation of said second gear around said second hub.

112 8.(NEW) The handcuff of claim 7 further comprised of a third gear rotatably attached to a third
113 hub which is perpendicularly affixed to said planar base, said third gear is equipped with a
114 fourth set of teeth and is adapted to rotate around said third hub in a plane parallel to said
115 planar base;

116 said fourth set of teeth is adapted for intermeshing contact with said first set of teeth on
117 said first gear and said third set of teeth on said second gear upon rotation of said first gear
118 around said first hub and said second gear around said second hub.

119 9.(NEW) The handcuff of claim 8 wherein said rod is adapted to contact said fourth set of teeth
120 on said third gear to control the rotation of said first gear around said first hub, said second
121 gear around said second hub and said third gear around said third hub.

122 10.(NEW) The apparatus of claim 2 wherein said improved cam is adapted to receive a key
123 means to permit mechanical rotation of said improved cam.

11.(NEW) The apparatus of claim 2 wherein said rod is adapted to contact said first set of teeth on said first gear.

12.(NEW) The apparatus of claim 7 wherein said rod is adapted to contact said third set of teeth on said second gear.

13.(NEW) An improved handcuff comprised of at least a first gear, a swing arm, a rod and a cam wherein:

said first gear is rotatably attached to a first hub which is perpendicularly affixed to a planar base, said first gear is equipped with a first set of teeth and is adapted to rotate around said first hub in a plane parallel to said planar base;

said swing arm is rotatably attached to said planar base and is equipped with a second set of teeth adapted for intermeshing contact with said first set of teeth upon rotation of said first gear around said first hub;

said rod is slidably mounted on said planar base and is adapted to control the rotation of said first gear around said first hub; and

said cam is rotatably attached to a cam axle which is perpendicularly affixed to said planar base, said cam is equipped with means to linearly move said rod upon rotation of said cam around said cam axle;

wherein the improvement of said apparatus is comprised of an improved cam and an actuation arm in combination with said rod and said at least first gear;

said improved cam is a substantially circular plate attached to said cam axle, said improved cam, which is adapted to rotate around said cam axle in a plane parallel to said planar base, includes a first slot, a first groove, shoulder means for linearly moving said rod, a top surface and a bottom surface;

147 said first slot penetrates said improved cam from said top surface to said bottom surface
148 thereof and extends radially from the edge of said improved cam toward said cam axle;
149 said first groove is formed in at least a peripheral portion of said improved cam between
150 said top surface and said bottom surface of said improved cam and extends from the edge of
151 said improved cam toward said cam axle, said first groove intersects said first slot;
152 said actuation arm is comprised of a housing and a cylinder;
153 said housing is fixed to said planar base and is positioned thereon to avoid contact with
154 said improved cam, said housing has two open ends and a hollow interior wherein at least one
155 coil, adapted to conduct an electric current, is positioned in said hollow interior;
156 said cylinder includes a solid portion and hollow portion having a closed end, wherein
157 said solid portion is adapted to longitudinally slide within said at least one coil in said hollow
158 interior of said housing, and said hollow portion is slidably positioned within said first groove of
159 said improved cam;
160 said hollow portion of said cylinder contains a second slot, a first biasing spring, a
161 second biasing spring and a pin positioned between said first biasing spring and said second
162 biasing spring;
163 said second slot, which is formed in opposite walls of said hollow portion of said
164 cylinder, is parallel to the longitudinal axis of said cylinder, said second slot intersects said first
165 slot when said cylinder is positioned in said in said first groove;
166 said pin is positioned in said hollow portion of said cylinder perpendicular to said
167 longitudinal axis of said cylinder and extends from said second slot into said first slot, whereby
168 linear movement of said cylinder is converted by said pin to rotational movement of said
169 improved cam to thereby linearly move of said rod to control rotation of said at least first gear.